

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NO. RP9-99-111

In re Application of:

RAVI S. ADAPATHYA, ET AL.

Serial No. 09/404,182

Filed: 24 SEPTEMBER 1999

For: ASYMMETRICAL COMPUTER  
MOUSE DESIGN WITH  
EXTENDED THUMB BUTTONS

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Examiner: ABDULSELAM, A.

Art Unit: 2674

#9

APPEAL BRIEF

Honorable Commissioner of Patents  
Washington, D.C. 20231

Sir:

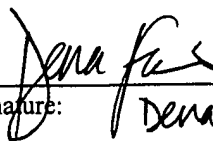
This Brief is submitted in triplicate in support of the Appeal in the above-referenced application.

CERTIFICATE OF MAILING

37 CFR 1.8(a)

I hereby certify that this correspondence is, on the date shown below, being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D. C. 20231.

10/31/2001  
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Signature: Dena Farris

### **REAL PARTY IN INTEREST**

The Real Party in Interest in the present Appeal is International Business Machines Corporation, the assignee, as evidenced by the assignment set forth at Reel 010275, Frame 0777.

### **RELATED APPEALS AND INTERFERENCES**

No related appeals or interferences are known to Appellant, Appellant's legal representative, or assignee which will directly affect, or be directly affected by, or have a bearing on the Board's decision in the present Appeal.

### **STATUS OF THE CLAIMS**

Claims 1-51 stand finally rejected by the Examiner as noted in the Office Action dated September 25, 2001, and are on appeal.

### **STATUS OF THE AMENDMENTS**

No amendments to the claims were proposed or entered subsequent to the final rejection.

### **SUMMARY OF THE INVENTION**

As set forth in the drawings and in the specification beginning at page 8, the present invention provides for an ergonomic computer mouse that has an arcuate top surface, a front end, a rear end, and left and right sidewalls. Page 9, lines 1-4. The top surface has a circular side view profile that extends from the front end to the rear end and is contiguous with finger buttons on the mouse. Page 9, lines 5-20. The surface of the left or thumb sidewall is uniquely contoured for the left side of the user's hand and thumb. Page 10, lines 1-2. A large thumb ball support protrudes from the rear half of the left sidewall at an incline. Page 10, lines 15-21. The thumb ball support and rear end have a circular shape when viewed from above. Page 11, lines 1-10. The left sidewall also has a concave thumb channel for the thumb of the user. Page 11, lines 13-17. An elongated thumb button is located above the thumb channel in order to avoid accidental thumb button actuations. Page 12, line 5, through page 13, line 10. The mouse also

has a pair of finger buttons and a scroll tab at the front of its top surface. Page 13, line 11, through page 14, line 4.

### **ISSUE**

Is the Examiner's rejection of claims 1-51 as unpatentable over U.S. Patent No. 5,530,455 (*Gillick*) in view of U.S. Patent No. 6,031,518 (*Adams*) well founded?

### **GROUPING OF THE CLAIMS**

For purposes of this appeal, claims 1-51 stand or fall together as a single group.

### **ARGUMENTS**

The Examiner has rejected claims 1-51 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,530,455 (*Gillick*) in view of U.S. Patent No. 6,031,518 (*Adams*). Final Office Action, Paper No. 6, paragraph 2. The Examiner's rejection is not well founded and it should be reversed.

The shortcomings of the prior art, such as those of the cited references, were discussed in Applicant's Background section of the present application. For example, both references use a thumb button on their left side walls that are intended for use by the thumb. Although the thumb buttons provide a valuable function, a portion of the population of mouse users finds it difficult to use effectively due to the placement and size of the button. With respect to placement, the thumb buttons of both prior art references are co-located at or near the natural point of contact by the user's thumb on the left side of the mouse. As the mouse is moved about the mouse pad to reposition the computer cursor, the thumb button is prone to be inadvertently depressed or "clicked" since the button is located at or near the natural point of contact of the thumb. Unwanted button clicks reduce the efficiency of the mouse device by increasing user errors and frustration.

### The Adams Reference

*Adams* discloses an ergonomic input device that, as a critical design element, does not have any finger buttons on its top surface. Instead, thumb buttons 28, 30 are provided for those functions, and the fingers are only required to *slide* or roll a ball and wheel instead of depressing buttons. Column 7, lines 55-57. *Adams* is replete with language that emphasizes the importance of this design feature, such as, "[the] fingers are oriented in neutral postures for operation of the actuators." Column 1, lines 61-62; column 4, lines 26-29. The overall configuration of the mouse and the arrangement of the actuators permits the user to carry out *all* of the functions provided by the actuators while the forearm is in a neutral position zone. Column 1, lines 64-66. The actuators and shape of the device also minimizes extension of the fingers and, in particular, minimizes abduction and adduction of the fingers. Column 2, lines 16-18; column 6, lines 47-48. *Adams'* design constraint of restricting movement of the hand to the user's thumb so that the user's fingers and forearm are isolated from movement is a critical distinction that cannot be overemphasized.

### The Gillick Reference

The avoidance of finger buttons on top of *Adams'* mouse is a critical distinction because it prevents *Adams* from being combined with the other and more conventional cited reference, *Gillick*. *Gillick* discloses a more typical mouse having two top surface finger buttons 18, 22 that must be depressed by the fingers of the user. *Adams* teaches one skilled in the art to avoid top surface finger buttons, like those of *Gillick*, to maintain the fingers in a neutral position such that they are only used for sliding the trackball or wheel rather than depressing buttons. It would not be obvious for one skilled in the art to combine these references since *Adams* is completely opposed to the teachings of *Gillick*. Moreover, there is certainly no suggestion and there is even a "teaching away" from joining these references. "A reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered." *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986). *Adams* "would likely discourage the art worker from attempting the substitution suggested by [Examiner]." *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 16 USPQ2d

1923 (Fed. Cir. 1990). Thus, *Gillick* is effectively disqualified from being used with *Adams* and the claims cannot be rejected under § 103 with this combination of references.

Even if the references could be joined, claim 1 still has several features that are distinguishable over the combination. Claim 1 requires "a plurality of finger buttons on the top surface of the body adjacent to the front end." Since *Adams* teaches away from the use of one's fingers to actuate buttons on the top surface of the mouse, one skilled in the art would not be inclined to combine *Adams* with *Gillick*, the latter of which teaches the common practice of using finger buttons on the top surface of the mouse. Claim 1 also requires "a thumb button *extending* from the thumb sidewall and located *above* the thumb channel so that the thumb of the user will be *free of contact* with the thumb button when the thumb of the user is in the thumb channel" (emphasis added). *Adams* specifically shows and describes a flush-mounted thumb button that is in continuous contact with the user's thumb. *Adams'* thumb button is not located above the user's thumb. Consequently, one skilled in the art would not be inclined to combine a reference (*Gillick*) that teaches a conventional thumb button and thumb button configuration, with another reference (*Adams*) that teaches to the contrary.

Claim 2 states that "the top surface of the body has an arcuate side view profile that is substantially defined by a single radius, and wherein the profile extends from the front end to the rear end." This claim is illustrated in Applicant's Figure 4, wherein the single radius 55 defines the curvature of the top surface, all the way from front end 47 to rear end 49. In contrast, *Adams'* Figure 5 shows a top surface that is only arcuate at element 88, but not to the left or right (element 86). *Adams'* top surface is certainly not arcuate at front end 38 or rear end 82, or defined by a single radius.

Claim 3 states that "the rear end of the body is substantially contiguous in shape with the profile of the top surface." This is only possible if the rear end is circumscribed along the same radius as the top surface adjacent to it. Since *Adams'* top surface 86 (Figure 5) is flat prior to interconnecting with rear end 82, it cannot be contiguous in shape with it. Similarly, claim 4

requires the finger buttons to be contiguous in shape with the profile of the top surface. First, *Adams* has no finger buttons and actually avoids them on the top surface. Second, the top surface is flat as it intersects front end 38. Claim 5 continues this theme by requiring the top surface to span an arcuate segment of approximately 110 degrees (see Applicant's Figure 4). This is in direct contrast to *Adams*' Figure 5, which is only arcuate for approximately 40 degrees (20 degrees to the left and to the right of element 88). The rest of the top surface of *Adams* is flat and has fixed slopes.

Claim 6 requires the front edge of the top surface of the body to be forward of the front edge of the bottom surface. In other words, the front end of Applicant's mouse leans forward (again see Figure 4). This requirement is not found in the cited references which disclose identical front ends having vertically upright front ends that are perpendicular to their respective bottom surfaces. See Figure 5 of *Adams* and Figure 1 of *Gillick*.

Claim 7 states that "the thumb sidewall is inclined outward at the front end of the body, and the thumb sidewall is inclined inward at the rear end of the body." This element is best illustrated in Applicant's Figures 8 and 9. In Figure 8, thumb sidewall 51 inclines away (angle 61) from the mouse, and, in Figure 9, thumb sidewall 51 inclines toward (angle 78) the mouse. In contrast, Figures 9 and 10 of *Adams* clearly show vertical thumb sidewalls 84 that are almost perpendicular to the support surface.

Claim 8 is directed to Applicant's Figure 6 wherein the thumb ball support 71 "has an arcuate top view profile that is substantially defined by a single radius." Clearly, a circle is circumscribed by radius 80 about center point 75 to define the thumb ball support. In contrast, *Adams*' Figure 4 shows a relatively flat thumb ball support 84 that engages a separate rounded rear end 82. Similarly, claim 9 (which depends from claim 8) states that "the rear end of the body has an arcuate top view profile that is contiguous with the top view profile of the thumb ball support." Figure 4 of *Adams* clearly demonstrates that its support 84 and rear end 82 are not defined by a single radius. Claim 10 takes this distinguishing element a step further by

specifically requiring the thumb ball support and the rear end to form "an arcuate segment of approximately 225 degrees." Since the side and rear ends of *Adams* are not a contiguous, single-radius segment, they cannot satisfy this requirement of claim 10.

Claim 11 is allowable for the same reasons as claim 7 and more so. *Adams'* Figure 9 shows a near vertical or perpendicular thumb wall, while claim 11 requires the thumb ball support to taper "into the thumb sidewall at angle of approximately 45 degrees." Claim 12 requires the thumb ball support to extend from a lower portion of the thumb sidewall.

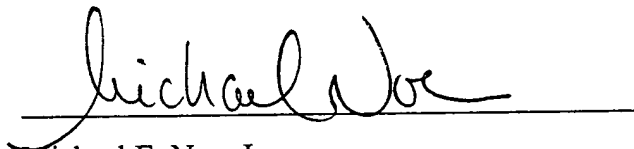
The elements of claim 13 are best illustrated in Figure 6, wherein "the body has a width [element 80 plus element 73] measured from the opposite sidewall to an edge of the thumb ball support, and the thumb ball support [element 80] comprises about 25 to 35% of the width of the body beyond the thumb sidewall." Figure 4 of *Adams* shows a thumb ball support comprising, at best 5% of the total width of the mouse. Claim 14 defines the thumb button as "arcuate in shape and about 1.5 inches long." Claim 15 adds an unique "concave detent [95] located between the finger buttons [91, 93]." *Adams* has no finger buttons, and *Gillick* shows convex and flat surfaces. Finally, claim 16 adds "a scroll tab extending from the detent, and wherein the finger buttons have inner lateral side edges that abut each other rearward of the detent." Again, *Adams* has no finger buttons, and *Gillick's* finger buttons are completely spaced apart.

Independent claim 17 has all the elements of claim 1 and also incorporates most of the language of claims 2 and 8. Claim 17 requires finger buttons on top of the mouse, and a thumb button extending from and located above the thumb channel free of contact with the user's thumb. Each of these elements contradict the objectives of *Adams*. Claim 17 also requires the top surface to be defined by a single radius from the front end to the rear end, and for the thumb ball support to have an arcuate top view profile that is defined by a single radius. The remaining claims 18-51 contain many of the same elements as the previous claims. Each of these claims include various combinations of the unique elements previously named and distinguished over the prior art.

For these reasons, it is respectfully urged that the claims are in condition for allowance and favorable action is requested.

Please charge Deposit account No. **50-0563** in the amount of \$320.00 for submission of a Brief in Support of Appeal. No Additional fee is believed to be required; however, in the event an additional fee is required please charge that fee to Deposit Account No. **50-0563**.

Respectfully Submitted,

A handwritten signature in cursive script, reading "Michael E. Noe, Jr.", written over a horizontal line.

Michael E. Noe, Jr.  
Registration No.: 44,975  
BRACEWELL & PATTERSON, L.L.P.  
Suite 350 Lakewood on the Park  
7600B North Capital of Texas Highway  
Austin, Texas 78731  
512.343.6116

ATTORNEY FOR APPLICANT(S)



## APPENDIX

1. An ergonomic computer mouse, comprising:

a body having a bottom surface, a top surface, a front end, a rear end, a thumb sidewall, and an opposite sidewall;

a plurality of finger buttons on the top surface of the body adjacent to the front end;

a thumb ball support extending from a rearward portion of the thumb sidewall, the thumb ball support being adapted to support a proximal end of a thumb of a user where the thumb connects to a hand of the user;

a concave thumb channel in the thumb sidewall located forward of the thumb ball support for receiving the thumb of the user; and

a thumb button extending from the thumb sidewall and located above the thumb channel so that the thumb of the user will be free of contact with the thumb button when the thumb of the user is in the thumb channel.

2. The ergonomic computer mouse of claim 1 wherein the top surface of the body has an arcuate side view profile that is substantially defined by a single radius, and wherein the profile extends from the front end to the rear end.

3. The ergonomic computer mouse of claim 2 wherein the rear end of the body is substantially contiguous in shape with the profile of the top surface.

4. The ergonomic computer mouse of claim 2 wherein the finger buttons are substantially contiguous in shape with the profile of the top surface.

5. The ergonomic computer mouse of claim 2 wherein the profile of the top surface forms an arcuate segment of approximately 110 degrees.

1 6. The ergonomic computer mouse of claim 1 wherein a front edge of the top surface of the  
2 body is forward of a front edge of the bottom surface, and the front end extends from the front  
3 edge of the top surface to the front edge of the bottom surface.

1 7. The ergonomic computer mouse of claim 1 wherein the thumb sidewall is inclined  
2 outward at the front end of the body, and the thumb sidewall is inclined inward at the rear end of  
3 the body.

1 8. The ergonomic computer mouse of claim 1 wherein the thumb ball support has an arcuate  
2 top view profile that is substantially defined by a single radius.

1 9. The ergonomic computer mouse of claim 8 wherein the rear end of the body has an  
2 arcuate top view profile that is contiguous with the top view profile of the thumb ball support.

1 10. The ergonomic computer mouse of claim 9 wherein the thumb ball support and the rear  
2 end form an arcuate segment of approximately 225 degrees.

1 11. The ergonomic computer mouse of claim 1 wherein the thumb ball support tapers into the  
2 thumb sidewall at angle of approximately 45 degrees.

1 12. The ergonomic computer mouse of claim 1 wherein the thumb ball support extends from  
2 a lower portion of the thumb sidewall.

1 13. The ergonomic computer mouse of claim 1 wherein the body has a width measured from  
2 the opposite sidewall to an edge of the thumb ball support, and the thumb ball support comprises  
3 about 25 to 35% of the width of the body beyond the thumb sidewall.

1 14. The ergonomic computer mouse of claim 1 wherein the thumb button is arcuate in shape  
2 and about 1.5 inches long.

1 15. The ergonomic computer mouse of claim 1, further comprising a concave detent located  
2 between the finger buttons.

1 16. The ergonomic computer mouse of claim 15, further comprising a scroll tab extending  
2 from the detent, and wherein the finger buttons have inner lateral side edges that abut each other  
3 rearward of the detent.

1 17. An ergonomic computer mouse, comprising:

2 a body having a bottom surface, a top surface, a front end, a rear end, a thumb sidewall,  
3 and an opposite sidewall, wherein the top surface has an arcuate side view profile that is  
4 substantially defined by a single radius, and wherein the profile extends from the front end to the  
5 rear end;

6 a plurality of finger buttons on the top surface of the body adjacent to the front end;

7 a thumb ball support extending from a rearward portion of the thumb sidewall and having  
8 an arcuate top view profile that is substantially defined by a single radius, the thumb ball support  
9 being adapted to support a proximal end of a thumb of a user where the thumb connects to a hand  
10 of the user;

11 a concave thumb channel in the thumb sidewall located forward of the thumb ball support  
12 for receiving the thumb of the user; and

13 a thumb button extending from the thumb sidewall and located above the thumb channel  
14 so that the thumb of the user will be free of contact with the thumb button when the thumb of the  
15 user is in the thumb channel.

1 18. The ergonomic computer mouse of claim 17 wherein the rear end of the body is  
2 substantially contiguous in shape with the profile of the top surface.

1 19. The ergonomic computer mouse of claim 17 wherein the finger buttons are substantially  
2 contiguous in shape with the profile of the top surface.

1 20. The ergonomic computer mouse of claim 17 wherein the profile of the top surface forms  
2 an arcuate segment of approximately 110 degrees.

1 21. The ergonomic computer mouse of claim 17 wherein a front edge of the top surface of the  
2 body is forward of a front edge of the bottom surface, and the front end extends from the front  
3 edge of the top surface to the front edge of the bottom surface.

1 22. The ergonomic computer mouse of claim 17 wherein the thumb sidewall is inclined  
2 outward at the front end of the body, and the thumb sidewall is inclined inward at the rear end of  
3 the body.

1 23. The ergonomic computer mouse of claim 17 wherein the rear end of the body has an  
2 arcuate top view profile that is contiguous with the top view profile of the thumb ball support.

1 24. The ergonomic computer mouse of claim 23 wherein the thumb ball support and the rear  
2 end form an arcuate segment of approximately 225 degrees.

1 25. The ergonomic computer mouse of claim 17 wherein the thumb ball support tapers into  
2 the thumb sidewall at angle of approximately 45 degrees.

1 26. The ergonomic computer mouse of claim 17 wherein the thumb ball support extends from  
2 a lower portion of the thumb sidewall.

1 27. The ergonomic computer mouse of claim 17 wherein the body has a width measured from  
2 the opposite sidewall to an edge of the thumb ball support, and the thumb ball support comprises  
3 about 25 to 35% of the width of the body beyond the thumb sidewall.

1 28. The ergonomic computer mouse of claim 17 wherein the thumb button is arcuate in shape  
2 and about 1.5 inches long.

1 29. An ergonomic computer mouse, comprising:  
2 a body having a bottom surface, a top surface, a front end, a rear end, a thumb sidewall,  
3 and an opposite sidewall, wherein the thumb sidewall is inclined outward at the front end of the  
4 body, and the thumb sidewall is inclined inward at the rear end of the body;  
5 a plurality of finger buttons on the top surface of the body adjacent to the front end;  
6 a thumb ball support extending from a rearward portion of the thumb sidewall, the thumb  
7 ball support being adapted to support a proximal end of a thumb of a user where the thumb  
8 connects to a hand of the user;  
9 a concave thumb channel in the thumb sidewall located forward of the thumb ball support  
10 for receiving the thumb of the user; and wherein  
11 the top surface, the rear end, and the finger buttons form a contiguous, arcuate side view  
12 profile that is substantially defined by a single radius and extends from the front end to the rear  
13 end.

1 30. The ergonomic computer mouse of claim 29 wherein the profile forms an arcuate  
2 segment of approximately 110 degrees.

1 31. The ergonomic computer mouse of claim 29 wherein a front edge of the top surface of the  
2 body is forward of a front edge of the bottom surface, and the front end extends from the front  
3 edge of the top surface to the front edge of the bottom surface.

1 32. The ergonomic computer mouse of claim 29 wherein the thumb ball support has an  
2 arcuate top view profile that is substantially defined by a single radius.

1 33. The ergonomic computer mouse of claim 32 wherein the rear end of the body has an  
2 arcuate top view profile that is contiguous with the top view profile of the thumb ball support.

1 34. The ergonomic computer mouse of claim 33 wherein the thumb ball support and the rear  
2 end form an arcuate segment of approximately 225 degrees.

1 35. The ergonomic computer mouse of claim 29 wherein the thumb ball support tapers into  
2 the thumb sidewall at angle of approximately 45 degrees.

1 36. The ergonomic computer mouse of claim 29 wherein the thumb ball support extends from  
2 a lower portion of the thumb sidewall.

1 37. The ergonomic computer mouse of claim 29 wherein the body has a width measured from  
2 the opposite sidewall to an edge of the thumb ball support, and the thumb ball support comprises  
3 about 25 to 35% of the width of the body beyond the thumb sidewall.

1 38. An ergonomic computer mouse, comprising:

2 a body having a bottom surface, a top surface, a front end, a rear end, a thumb sidewall,  
3 and an opposite sidewall, wherein the thumb sidewall is inclined outward at the front end of the  
4 body, and the thumb sidewall is inclined inward at the rear end of the body;

5 a plurality of finger buttons on the top surface of the body adjacent to the front end;

6 a thumb ball support extending from a rearward portion of the thumb sidewall, the thumb  
7 ball support being adapted to support a proximal end of a thumb of a user where the thumb  
8 connects to a hand of the user;

9 a concave thumb channel in the thumb sidewall located forward of the thumb ball support  
10 for receiving the thumb of the user; wherein

11 the thumb ball support and the rear end of the body form a contiguous, arcuate top view  
12 profile with the rear end of the body that is substantially defined by a single radius; and wherein  
13 the body has a width measured from the opposite sidewall to an edge of the thumb ball  
14 support, and the thumb ball support comprises about 25 to 35% of the width of the body beyond  
15 the thumb sidewall.

1 39. The ergonomic computer mouse of claim 38 wherein the top surface of the body has an  
2 arcuate side view profile that is substantially defined by a single radius, and wherein the profile  
3 extends from the front end to the rear end.

1 40. The ergonomic computer mouse of claim 39 wherein the rear end of the body is  
2 substantially contiguous in shape with the profile of the top surface.

1 41. The ergonomic computer mouse of claim 39 wherein the finger buttons are substantially  
2 contiguous in shape with the profile of the top surface.

1 42. The ergonomic computer mouse of claim 39 wherein the profile of the top surface forms  
2 an arcuate segment of approximately 110 degrees.

1 43. The ergonomic computer mouse of claim 38 wherein a front edge of the top surface of the  
2 body is forward of a front edge of the bottom surface, and the front end extends from the front  
3 edge of the top surface to the front edge of the bottom surface.

1 44. The ergonomic computer mouse of claim 43 wherein the thumb ball support and the rear  
2 end form an arcuate segment of approximately 225 degrees.

1 45. The ergonomic computer mouse of claim 38 wherein the thumb ball support tapers into  
2 the thumb sidewall at angle of approximately 45 degrees.

1 46. The ergonomic computer mouse of claim 38 wherein the thumb ball support extends from  
2 a lower portion of the thumb sidewall.

1 47. An ergonomic computer mouse, comprising:

2 a body having a bottom surface, a top surface, a front end, a rear end, a thumb sidewall,  
3 and an opposite sidewall, wherein the thumb sidewall is inclined outward at the front end of the  
4 body, and the thumb sidewall is inclined inward at the rear end of the body;

5 a plurality of finger buttons on the top surface of the body adjacent to the front end,  
6 wherein the top surface, the rear end, and the finger buttons form a contiguous, arcuate side view  
7 profile that is substantially defined by a single radius and extends from the front end to the rear  
8 end;

9 a thumb ball support extending from a rearward portion of the thumb sidewall, the thumb  
10 ball support being adapted to support a proximal end of a thumb of a user where the thumb  
11 connects to a hand of the user, wherein the thumb ball support and the rear end of the body form  
12 a contiguous, arcuate top view profile with the rear end of the body that is substantially defined  
13 by a single radius;

14 a concave thumb channel in the thumb sidewall located forward of the thumb ball support  
15 for receiving the thumb of the user; and wherein

16 the body has a width measured from the opposite sidewall to an edge of the thumb ball  
17 support, and the thumb ball support comprises about 25 to 35% of the width of the body beyond  
18 the thumb sidewall.

1 48. The ergonomic computer mouse of claim 47 wherein the profile of the top surface forms  
2 an arcuate segment of approximately 110 degrees.



1 49. The ergonomic computer mouse of claim 47 wherein a front edge of the top surface of the  
2 body is forward of a front edge of the bottom surface, and the front end extends from the front  
3 edge of the top surface to the front edge of the bottom surface.

1 50. The ergonomic computer mouse of claim 47 wherein the thumb ball support and the rear  
2 end form an arcuate segment of approximately 225 degrees.

1 51. The ergonomic computer mouse of claim 47 wherein the thumb ball support tapers into  
2 the thumb sidewall at angle of approximately 45 degrees.

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Attorney Docket No.: **RP9-99-111**  
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WITH EXTENDED THUMB BUTTONS**

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3. Certificate of Mailing thereon; and
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Our File No.: **0252AD- RP9-99-111**  
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